R-009-208.26

2814

RESPONSE TO U.S. EPA AND OHIO EPA COMMENTS FOR THE CONDITIONALLY APPROVED PART 5 WORK PLAN AND TRANSMITTAL OF REVISED HYDROPUNCH PROCEDURE

02/04/92

DOE-816-92
DOE-FO/EPA
2
LETTER
OU5

Department of Ei
Fernald Environmental Management Project
P.O. Box 398705
Cincinnati, Ohio 45239-8705
(513) 738-6357

2814

FEB 0 4 199

DOE-816-92

Mr. James A. Saric, Remedial Project Director
U. S. Environmental Protection Agency
Region V - 5HR-12
230 South Dearborn Street
Chicago, Illinois 60604

Mr. Graham E. Mitchell, Project Manager
Ohio Environmental Protection Agency
40 South Main Street
Dayton, Ohio 45402-2086

Dear Mr. Saric and Mr. Mitchell:

RESPONSE TO U.S. EPA AND OHIO EPA COMMENTS FOR THE CONDITIONALLY APPROVED PART 5 WORK PLAN AND TRANSMITTAL OF REVISED HYDROPUNCH PROCEDURE

References: 1) Letter, J. A. Saric to J. R. Craig, "Conditional Approval of the Revised South Plume Work Plan," dated September 16, 1991

2) Letter, G. E. Mitchell to J. R. Craig, "Conditional Approval of the Revised South Plume Removal Action Work Plan," dated September 4, 1991

Enclosure 1 is the responses to U.S. EPA and Ohio EPA comments (References 1 and 2) on the Part 5 Work Plan which was conditionally approved. Also enclosed is the revised Hydropunching procedure (Enclosure 2). The Soil Vapor procedure is still being revised to reflect internal comments.

Due to some additional concerns generated from issues discussed in Enclosure 3, a revision to the Part 5 Work Plan is being evaluated. Based on these concerns, DOE would like to propose modifications to the work plan as described in Enclosure 4. After your review of these concerns and proposed modifications, please inform us of your response. We will be glad to meet with you to further discuss these concerns.

If you or your staff have any questions, please do not hesitate to contact me at FTS 774-6159 or (513) 738-6159, or Carlos J. Fermaintt at FTS 774-6157 or (513) 738-6157.

Sincerely,

Johnny Reising

for Jack R. Craig
Fernald Remedial Action
Project Manager

FO:Fermaintt

Enclosure: As Stated

cc w/enc.:

J. J. Fiore, EM-42, TREV
K. A. Hayes, EM-424, TREV
J. Benetti, USEPA-V, 5AR-26
T. Schneider, OEPA-Dayton
J. P. Hopper, WEMCO
L. Kahill, Radian
AR Coordinator, WEMCO

cc w/o enc.:

D. J. Brettschneider, WEMCO

modifications, please inform us of your response. We will be glad to meet with you to further discuss these concerns

- Sample container lids will be tightly secured.

- Samples will be properly labeled and chain-of-custody records, sample collection logs, and laboratory request for analysis forms will be properly completed.

6.1.2 WATER LEVEL MEASUREMENTS

The following procedures should be followed for collecting water level data from wells:

- Obtain permission from owner to measure water level in well if required off site.
- In the case of domestic wells, ask the owner not to use water for short time so pump does not activate and affect water level. Make sure water level is stable.
- Remove well cap if an access hole is not available. (Be sure not to take water-level measurements in the riser pump discharge line.)
- Lower M-scope probe until water is reached (this will be indicated by a buzzer, meter needle deflection, or light); raise probe above the water level and slightly shake; then lower again and recheck. Be careful not to get tangled with electrical wiring from pump, if present.
- Note depth to water to 0.01 foot from the measuring point, i.e., top of casing, top of sanitary seal.
- Enter water level and measuring point in log with date and time or on Figure 5-11, Piezometer Data Sheet.
- Replace cover on well.

6.1.3 Hydropunch II Sampling

The Hydropunch II is a sampling tool and although this procedure may be applicable to other samplers that work on a similar principal, these procedures are specific to the Hydropunch II. These procedures are based on the operating procedures issued by the manufacturer, QED. Any changes to the operating procedures subsequently issued by the manufacturer will be incorporated into this procedure.

Application

The Hydropunch II sampler allows approximately a one-liter sample to be collected from a precise depth within an aquifer. The sampler is best used to determine vertical concentration gradients within an aquifer or to provide a number of screening samples that roughly delineate the lateral extent of a contaminant plume. Data collected with the Hydropunch II also helps determine the location of permanent monitoring wells.

[redacted]

2814

Sample Depths

The sampling depths will be selected by determining the screened interval between the 2000- and 3000-series wells in the area of interest and equally dividing the distance between the screens.

Limitations

There are a number of limitations to the application of the Hydropunch II sampler. The sample volume is limited to approximately one liter except in a special configuration mode designed for sampling floating hydrocarbons. This limited sample volume restricts the variety of analyses that can be performed on a sample.

The sampler is filled by water moving under hydrostatic pressure; thus the shallowest sample that can be collected in the normal sample configuration is at a depth that is at least the sampler length below the water table. There is no way to determine if the sampler has filled prior to bringing it to the surface; thus the sampler must be left in the open mode for 15 to 20 minutes to ensure that enough time has elapsed for hydrostatic pressure to force water in through the one-way valve.

Drilling Equipment

A hollow-stem auger, cable tool, or other drilling machine capable of driving the sampler into the ground is required. The following procedures are written from the perspective of using an auger rig; however, use of the sampler is independent of the drilling machine. These procedures are equally suited to any drilling method.

Standard Sampling Configuration

The Hydropunch II will be clean and dry with new O-rings, sample screen, and steel tip. The boring will be advanced to a depth that is one Hydropunch II length above the depth where the groundwater sample is to be collected. The Hydropunch II must be driven ahead of the boring to ensure that the sample is collected from an undisturbed part of the aquifer.

The Hydropunch II is attached to the standard AW-size drilling rods and lowered to the bottom of the boring. The sampler is driven into the unconsolidated sediments with either the hydraulic ram or the 140-pound sampling hammer on the drill rig. It is preferred that the hydraulic ram be used as there is less chance that the sampler will open during advancement. If the hammer is used, care must be taken so the sampler is not pulled up or bounced during the hammer operation.

The sampler is driven to a sufficient depth to assure that after the sampler has been opened, by pulling it up 18 inches, the top of the tool will still be below the water table. The sample depth is the final depth of the bottom of the sampler after it has been opened. Since hydrostatic pressure is the only force filling the tool, the top of the tool must be below the water table or it can not fill completely.

When the sampler has reached the designated depth it is pulled upward for 18 inches. This action causes the carbon steel tip of the sampler to be released into the sediment which opens the bottom end of the sampler to the environment. Groundwater enters the bottom opening, passes through a stainless steel screen which prevents the collection of particulates, then passes through a one-way valve into the sample chamber. A second one-way valve at the top of the sample chamber allows air in the chamber to be released while preventing entry of water from the top.

Once the sampler is opened it must be left in place for 15 to 20 minutes to allow it to completely fill with water. The rate of filling will vary with the depth of the sampler and the permeability of the saturated sediments. If field conditions allow, the time the sampler is left in place may be reduced as long as the sampler completely fills. During vertical profile sampling, the time allowed for the sampler to fill may be decreased as deeper samples are collected because of the increasing head driving the sample into the sampler.

The actual length of time the sampler is allowed to fill is at the discretion of the field task leader. The time will vary with depth and the nature of the sediments. The controlling requirement is that the sampler completely fill with each use. If the sampler does not fill completely there may not be sufficient water for the required analyses. If this happens the sampling must be repeated.

Once the sampler has filled it is brought back to the surface. The expendable steel tip remains in the ground. Once at the surface the sampler is disconnected from the drill rods and held in a vertical position until the sample discharge stopcock is screwed into the top of the sampler. At this point the sampler may be inverted and the stopcock is used to direct the sample into containers for field measurement or laboratory analysis.

Floating Hydrocarbon Sampling Configuration

The Hydropunch II will be clean and dry with all O-rings installed. The check valves and stainless steel screen used in the standard configuration will not be installed. Instead the 48-inch-long polypropylene screen will be installed according to the manufacturer's instructions and attached to the carbon steel drive point.

The Hydropunch II is attached to EW casing rather than AW drill rods and lowered to the bottom of the boring. AW and EW are size designations for drilling rods and casing adapted by the Diamond Core Drillers and Manufacturers Association (DCDMA). The sampler is then driven to a depth of approximately two feet below the water table. The depth to the water table must be determined with another boring or nearby well. Once the sampler has reached the designated depth it is pulled up for a distance of 40 inches. The drive point will remain in place while the sampler body is pulled up. This action exposes the polypropylene screen to the water table. Care must be taken not to pull the sampler body farther than 40 inches because the screen is 48 inches long. The eight-inch difference in length is a safety margin to reduce the likelihood that the screen will be pulled free from the drive point.

[redacted]

Once the sampler has been pulled up the water table and any floating hydrocarbons are free to enter the polypropylene screen. Sampling is accomplished with a one-inch nominal outside diameter bailer which can be lowered through the EW casing and the sampler body. The initial sampling with the bailer should be conducted carefully to determine the thickness of the free hydrocarbons on the water table surface. This is achieved by lowering the bailer to the fluid surface and then no more than three quarters of the bailer length below the fluid surface in a smooth steady motion. The bailer is then withdrawn with a smooth retrieval so as not to agitate the bailer contents. When the bailer reaches the surface, it is inspected for free hydrocarbons. If present, the thickness of the hydrocarbons is measured with a steel measuring tape and recorded on the Water Quality Field Collection Report in the "additional remarks" section.

After the initial sampling run to determine if hydrocarbons are present, the bailer is used as with any other well to collect the water for the prescribed sampling program.

Limitations of Configuration

Although it is possible to collect samples deeper than the water table, sampling with the floating-layer configuration of the Hydropunch II should only be attempted with new EW casing. Since the upper check valve is not installed in the sampler in this configuration, there is the possibility that leakage at any joint not protected with new O-ring seals will leak into the sampler. The sampler itself is five feet long and the casing is usually added in five-foot increments. The threaded joint at each of these connections was designed to minimize leakage, but not necessarily to prevent it entirely. With usage these joints will leak. If the sampler is passing down through a zone of free hydrocarbons, they have an opportunity to enter the sampler as each joint passes through the hydrocarbon layer.

Decontamination

The Hydropunch II sampler is first disassembled. The stainless steel sample screen and all O-rings are removed and discarded, as is the polypropylene screen. The sampler is then washed using the same procedures and steps as are used for cleaning a split-spoon sampler as documented in the RI/FS QAPP, Section 6.0, Page 26 of 59. When the sampler is clean and dry, new O-rings, stainless steel screen, and steel drive point are installed and the sampler is wrapped in plastic to keep it clean.

Rinsate Sampling

Rinsate samples are collected once for every 20 uses of a sampler. If multiple samplers are in operation, the rinsate is sampled once for every 20 washing operations. The purpose of the rinsate sample is to determine if the washing process is effective regardless of the number of tools in the operation.

6.2 FIELD ANALYTICAL PROCEDURES FOR GROUNDWATER SAMPLES

Immediately following sample collection, temperature, pH, specific conductant, and dissolved oxygen will be measured in the field and documented on the Water Quality Field Collection Report (Figure 6-1) from

the RI/FS QAPP, Section 6.0, Page 3 of 59. The following field procedures pertain to these tests. All determinations will be performed on unpreserved samples. In adverse weather conditions, field determinations may be performed indoors in an area maintained at 20 to 25 degrees in Celsius. Groundwater field measurements may also be taken in

Enclosure 1

[redacted]

Response to U.S. EPA Comments to the South Plume Removal Action Part 5 Work Plan

2814

Commenting Organization: U.S. EPA

Comment #1:

U.S. EPA is concerned with U.S. DOE's procedure for the collection of soil gas samples. Several published articles have demonstrated that adequate "purging" of the soil gas probe after it is emplaced in the soil prior to collecting the sample is essential in obtaining representative and comparable samples. Therefore, U.S. DOE should include a discussion on how they intent to purge the soil gas probe and document that representative and comparable samples are being collected. This is commonly done by recording the concentration of volatile organic compounds (VOC) present in the soil gas at regular intervals during the purging of the soil gas probe. Once a relatively steady state condition is observed, the VOC concentration in the soil gas is recorded.

Response:

The Document Change Request (DCR) for the soil gas sampling will address the concern expressed. ASI/IT has observed during numerous other soil vapor surveys that you must wait for a steady state reading in order to have reproducible results. Therefore, the DCR procedure calls for taking the peak reading for soil gas sampling and the stable reading rather than relying on either reading alone.

Action:

As noted in response.

Comment #2:

Soil gas probes should be decontaminated between sampling locations by high pressure steam cleaning.

Response:

The soil vapor survey is to be conducted over the lateral extension of the organic plume which is spreading on the water table surface. The rod for making the test hole and the sampling probe will be well above the zone of contamination, therefore there is no need to steam clean the equipment between usage. The rinse and wipe cleaning presented in the proposed DCR (not enclosed) is sufficient for the soil vapor study.

Action:

None

8

[redacted]

Enclosure 3

2814

Concerns have risen on the implementation of the conditionally approved Part 5 Work Plan and on the adequacy of the proposed work as currently defined. Recently generated concerns/changes are as stated below:

- Delta Steel has indicated that they are not granting DOE permission to install the permanent monitoring wells on their property. A court action will be necessary to proceed with installation of these wells.

- The purpose of the Delta Steel monitoring wells was to obtain field confirmation of uranium concentrations within the South Plume as predicted by the model. This would enable DOE to confirm if the Part 3 IAWWT design capacity is sufficient to treat an equivalent mass of uranium. The delay in obtaining access authority for installation of the Delta Steel wells has made their use questionable at this time.

- The location of the soil vapor survey as shown in the Work Plan is based on the first proposed re-positioning of the recovery well field (i.e. approximately 600 feet north of New Haven Road). The recovery well field has now been moved significantly farther north based on the free floating cumene discovered by the ongoing PRRS RI/FS. This cumene is in close proximity to the location of the proposed soil vapor survey. These two factors make the present location of the survey questionable.

- A plan for a pump test has been incorporated into the Part 2 Pump and Discharge project portion of the Operation and Maintenance Manual. The test will preformed on the center recovery well of the proposed five well pumping system. It has further been decided that the test will be implemented prior to the purchase of the well field (Part 2C) pumps and installation of the other four wells. Pump test observation wells/piezometers will be installed as part of the pump test. A determination of the location of these pump test observation wells/piezometers has not yet been made. An appendix to the O & M manual is being prepared to define the location of these wells. Due to the development of this appendix, the seven permanent monitoring wells shown in the Part 5 Work Plan may not be located to best provide the needed information.

[redacted]

Enclosure 4

2814

Proposed modifications to the Part 5 Work Plan to address the concerns/changes which have arisen since issuance of the plan.

- Installation of the seven permanent monitoring wells located north of the Part 2 well field will be delayed until the Test Well and O&M monitoring well network better defines the number and location required.

- Hydropunching will be used during installation of the Part 2D - Test Well installation to obtain the information needed to assist in confirmation of the uranium concentration that will be extracted.

- The proposed location of the hydropunching needs to be reevaluated. There is concern that the south row of hydropunching may be unnecessary and that a gap may be left north of the north row of hydropunching. It is proposed that the north row of hydropunching be performed first and the results obtained prior to proceeding with the south row. If no levels of uranium are detected above the 20 μg/l level, then the south row will be deleted from the scope of the project and a more northern row inserted. The plan will be revised to reflect the two step hydropunching effort.

- The soil vapor survey will be delayed and relocated pending obtaining results from the proposed hydropunching program.

- After the 20 μg/l and 30 μg/l isopleths locations are determined from the hydropunching effort (and any required follow-up effort) the location of the soil vapor survey will be redefined. The revised location will be determined based on the practicality of installing additional recovery wells south of the proposed well field (Zone 2 area as defined in the "Explanation of Significant Differences" document) to collect any remaining uranium plume not captured by the well field. Information obtained from the PRRS will also be used to determine the revised location.

[redacted]

Response to Ohio EPA Comments to the South Plume Removal Action Part 5 Work Plan

Commenting Organization: OEPA

2814

Comment #1:

Response to Ohio EPA Comment #6 (Pump Tests): Although it is not ideal Ohio EPA agrees to allow DOE to proceed at their own risk with design and construction of the well field without the suggested pump test. However, if the situation arises where the goals of the removal action are not being achieved after construction and start up, DOE will have to make whatever additions or modifications are necessary to meet these goals.

Response:

The design of the system should be adequate to meet the goals of the removal action. The start-up Operation and Maintenance (O&M) Manual for the removal pumping system (see Comment #2) addressed the possibility that, if for some unforeseen reason the system is inadequate, DOE will make the necessary corrections to achieve the removal action goals. However, the DOE has reconsidered its position on performing a pump test prior to completing installation of the removal well field due to concerns generated by U.S. EPA, OEPA and others. It has been decided that the center well of the proposed five unit well field will be installed and a pump test will be performed prior to purchase of the pumping units and installation of the remaining extraction wells. The pump test will be performed to properly stress the aquifer for the purpose of obtaining site specific aquifer parameters. The O&M manual will define the details of the pump test.

Action:

As noted in response

Comment #2:

Ohio EPA shall review the start up and operation and maintenance manual for this removal action. Under the proposed revised schedule, when will this manual be submitted to Ohio EPA for review and comment?

Response:

The draft Operation and Maintenance Plan for the removal pumping system was submitted to U.S. EPA and OEPA on November 1, 1991. Comments were received from both U.S. EPA and OEPA on January 10, 1992. Comment responses have recently been addressed by DOE and revisions to the O&M Manual are forthcoming.

Action:

As noted in response.

Comment #3:

Table 3: DOE should either add or justify excluding the following wells/piezometers to those to be sampled: 2540, 3062, and 3689. As shown on Figure 2, 3062 and 3689 appear to be directly upgradient of the extraction wells and could provide important data concerning uranium concentrations immediately captured by the wells. It would appear from Figure 2 that 2450 may provide data useful in determining the 30 µg/l and 20 µg/l isopleths.

Response:

Well 3689 is the northern of the two Albright & Wilson water supply wells. This well is slightly downgradient from the proposed extraction well field location that evolved from the modeling effort. Well 3062 is the southern Albright & Wilson water supply well and is monitored by WEMCO as part of the ongoing site wide monitoring program.

Piezometer 2540 is on the west side of the uranium plume as shown in the work plan Figure 2. The gradient in the area is to the south or southeast, therefore, this well is not downgradient from the area where elevated uranium is present. Wells 2393 and 2126 are upgradient of 2540 and have had readings at or near background. Uranium levels in wells along Paddys Run are being monitored in the Paddys Run South Seepage Investigation. Data from that sampling program will be combined with the data from this program to determine the extent of uranium contamination in the area.

Only well 3689 will be added to the sampling program in Table 3 of the work plan.

Action:

As noted in response.

Comment #4:

An additional objective for the groundwater modeling, as stated in previous Ohio EPA comments, should be to predict effects (not just impacts) the extraction wells will have on the Albright & Wilson and Ruetgers Nease groundwater contamination plumes.

Response:

The modeling effort has been used to determine how best to address the uranium plume and reduce and/or eliminate the effect on the PRRS plumes. This determination has been the key item in setting the location of the well field. The modeling report is presently under revision to better explain how the well field location was selected to develop pumping conditions where the "predicted effect" has no significant impact on the PRRS plumes.

Action:

As noted in response

Comment #5:

Page 13, Number 2: What information (field data, bench studies, literature values, etc.) resulted in DOE using the uranium retardation value of 12?

Response:

A copy of the draft Groundwater Report was sent to U.S. and Ohio EPAs on September 3, 1991. Sections 19 through 22 of the draft report contain a discussion of the development of the model and the establishment of the retardation factor.

Action:

As noted in response.